3.8 AIR QUALITY

This section discusses the climatic regime and existing air quality in the area between Tucson and Nogales, Arizona. Because this information applies to each alternative in the same manner, the discussion is combined rather than repeated separately for each alternative. Refer to Section 3.10.2, Corona Effects, for a discussion of potential photochemical reactions in the air surrounding transmission lines.

3.8.1 Climate

The climate in the vicinity of the project is an arid desert characterized by hot temperatures, large daily air temperature ranges, and sparse precipitation. Table 3.8–1 presents the climatological data for the Tucson area normalized over a period of 30 years.

Table 3.8–1. Climate Data for Tucson, Arizona.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature												
Average Daily Maximum Temperature (°F)	63.9	67.8	72.8	81.2	89.9	99.6	99.4	96.8	93.3	84.3	72.7	64.3
Average Daily Minimum Temperature (°F)	38.6	41.0	44.6	50.4	58.7	67.9	73.6	72.1	67.5	56.6	45.6	39.8
Average Monthly Temperature (°F)	51.3	54.4	58.7	65.8	74.0	83.8	86.6	84.5	80.4	70.4	59.2	52.0
Precipitation												
Maximum Monthly Precipitation (in)	4.81	2.90	2.26	1.66	1.11	1.46	6.17	7.93	5.11	4.98	1.90	5.02
Average Monthly Precipitation (in)	0.87	0.70	0.72	0.30	0.18	0.20	2.37	2.19	1.67	1.06	0.67	1.07
Minimum Monthly Precipitation (in)	T	0.00	0.00	0.00	0.00	0.00	0.01	0.23	0.00	0.00	0.00	0.00
Mean number of days of precipitation (0.1 in or more)	4.6	3.8	4.3	2.0	1.6	1.7	10.1	9.4	4.6	3.3	3.0	4.7
Percent of Possible Sunshine	80	82	86	92	93	93	78	80	87	88	85	79
Wind												
Mean Speed (mph)	7.9	8.1	8.6	8.9	8.8	8.7	8.4	7.9	8.3	8.2	8.1	8.3
Prevailing Wind Direction	SE	SE	SE	SE	SE	SSE	SE	SE	SE	SE	SE	SE

T = trace amount.
Source: Climate 2003.

The data show a mean annual temperature of 68.4ºF (20.2ºC) with average maximum temperatures ranging from 63.9ºF (17.7ºC) in January to 99.6ºF (37.6ºC) in June. The average annual precipitation for the period of record is 12.0 in (30.5 cm), peaking from July through September, with a second lower peak in the winter months. The average maximum precipitation ranges from 1.11 in (2.8 cm) in May to 7.93 in (20.1 cm) in August, with the minimum precipitation ranging from 0.0 in (0 cm) to 0.23 in (0.58 cm) in August. The mean number of days receiving 0.1 in (0.25 cm) or more of precipitation ranged from 1.6 days in May to 10.1 days in July. The percent of possible sunshine ranges from 78 percent to 93 percent.

The mean wind speed ranges from 7.9 mi per hour (13 km per hour) to 8.9 mi per hour (14 km per hour) with the direction of prevailing wind blowing from the southeast. Figure 3.8–1 is a "wind rose" of surface wind measurements taken in 1990 at the National Weather Station at Tucson International Airport (NOAA 2003).

The Coronado National Forest portion of each corridor is higher in elevation and has lower average temperatures and higher levels of precipitation than the rest of the corridors. For example, mean annual precipitation in evergreen woodland communities is 20 in (51 cm).

3.8.2 Air Quality

The U.S. Environmental Protection Agency (EPA) established air quality standards for six different pollutants, referred to as criteria pollutants, based on the protection of public health and the environment. These National Ambient Air Quality Standards (NAAQS) set limits for the following criteria pollutants: nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and inhalable particulate matter (PM_{10}), or particles with an aerodynamic diameter less than or equal to 10 microns. (The diameter of a human hair is approximately 70 microns.) In addition, in 1997 EPA finalized new air quality standards for ozone and $PM_{2.5}$ (particles with an aerodynamic diameter less than or equal to 2.5 microns). A series of legal challenges in the U.S. Court of Appeals ensued, culminating with the U.S. Supreme Court upholding the NAAQS for ozone and $PM_{2.5}$ on February 27, 2001. Based on the ambient (outdoor) levels of the criteria pollutants, EPA evaluates individual Air Quality Control Regions (AQCRs) to establish whether or not they meet the NAAQS. Areas that meet the NAAQS are classified as attainment areas, and areas that exceed the NAAQS for a particular pollutant(s) are classified as non-attainment areas for the pollutant(s). Areas that have been redesignated by EPA as attainment areas within the last 10 years are classified as maintenance areas.

There are over 100 ambient air quality monitoring sites located throughout Arizona (ADEQ 2002). These sites monitor air pollutants and other parameters on a continuous or periodic basis. The air pollutants monitored include: CO, hazardous air pollutants (metals), nitrogen oxides (NO_x), SO_2, O_3, specific Volatile Organic Compounds (VOCs), PM_{10}, and $PM_{2.5}$.

The proposed project is located within portions of Pima and Santa Cruz Counties. Table 3.8–2 shows the attainment status of the project area and vicinity. The project area is designated as being in attainment or unclassifiable for all criteria pollutants, with the exception of the Nogales area in Santa Cruz County, which is designated as a moderate non-attainment area for PM_{10}, and for which the state has set specific emissions and permitting requirements. The Tucson area is a CO maintenance area. Figure 3.8–2 shows the location of the proposed project relative to the Nogales PM_{10} non-attainment area and the Tucson CO maintenance area. EPA has not yet classified areas as being in attainment or non-attainment for $PM_{2.5}$ standards, as states are still collecting data to establish these classifications.

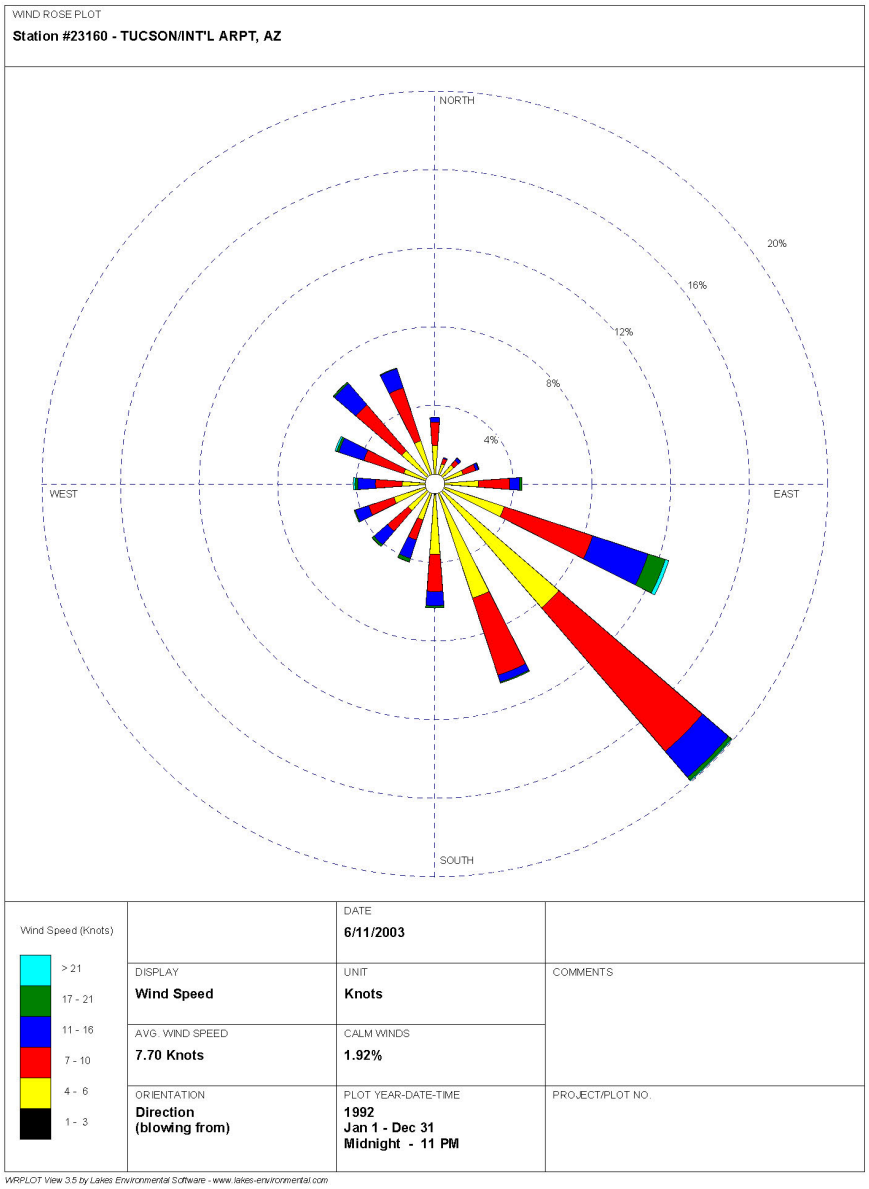

Figure 3.8–1. Wind Rose of Surface Winds at Tucson.

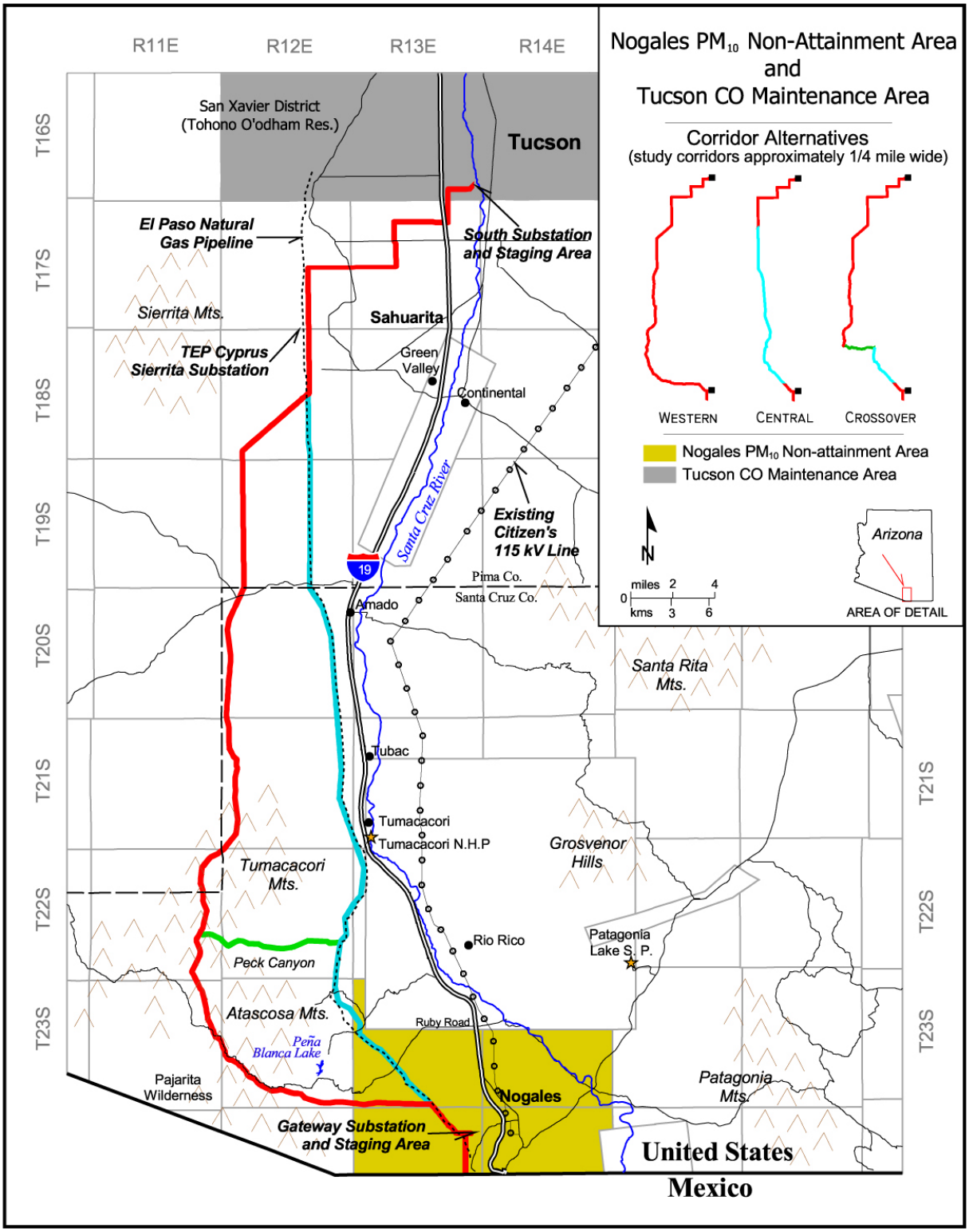

Figure 3.8–2. Nogales PM_{10} Non-attainment Area and Tucson CO Maintenance Area.

Table 3.8–2. Criteria Pollutant Attainment Status in the Proposed Project Area.

Area	Pollutant	Attainment Status[a]
Pima County (excluding Rillito and Ajo)[b]	NO_2	Unclassifiable
	SO_2	Better than national standards
	PM_{10}	Unclassifiable
	CO	Attainment[c]
	Pb	Attainment
	O_3	Unclassifiable/Attainment
Santa Cruz County (excluding Nogales for PM_{10})	NO_2	Unclassifiable
	SO_2	Better than national standards
	PM_{10}	Unclassifiable
	CO	Unclassifiable/Attainment
	Pb	Attainment
	O_3	Unclassifiable/Attainment
Santa Cruz County – Nogales	PM_{10}	Non-attainment (moderate)

[a] Unclassifiable areas are areas that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant.
[b] Rillito and Ajo are non-attainment areas northwest of Tucson, outside the area of study for the proposed project.
[c] The Tucson area was redesignated as a CO attainment area in 2000 and is thus classified as a CO maintenance area.
Source: EPA 2003.

The primary sources of PM_{10} in the project area are large copper mines, traffic on unpaved roads, construction activities, and significant natural events such as windstorms. Another potential source of PM_{10} associated with the Nogales area's non-attainment status is activities on the Mexican side of the international border (Yockey 2001). The Pima County Department of Environmental Quality (PDEQ) and Arizona Department of Environmental Quality (ADEQ) monitor air quality and regulate emissions of air pollutants from industrial and commercial facilities as required under the *Clean Air Act* (CAA) and state and local regulations. Attainment and maintenance of the NAAQS in the project area are governed by a federally enforceable air quality management plan, called a State Implementation Plan (SIP).

The CAA provides special protection for visibility and other air quality related values in specially designated areas such as National Parks and Wilderness Areas, officially designated as "Class I" areas. Special visibility modeling analysis must be performed for major new sources and modifications that may affect a Class I area under the CAA's Prevention of Significant Deterioration (PSD) program. The nearest Class I area to the proposed project is the Saguaro National Monument East, an estimated 18 mi (29 km) north of TEP's South Substation in Sahuarita (Yockey 2001). See Section 3.2 for discussion of visual range.